FIG. 1 (PRIOR ART)

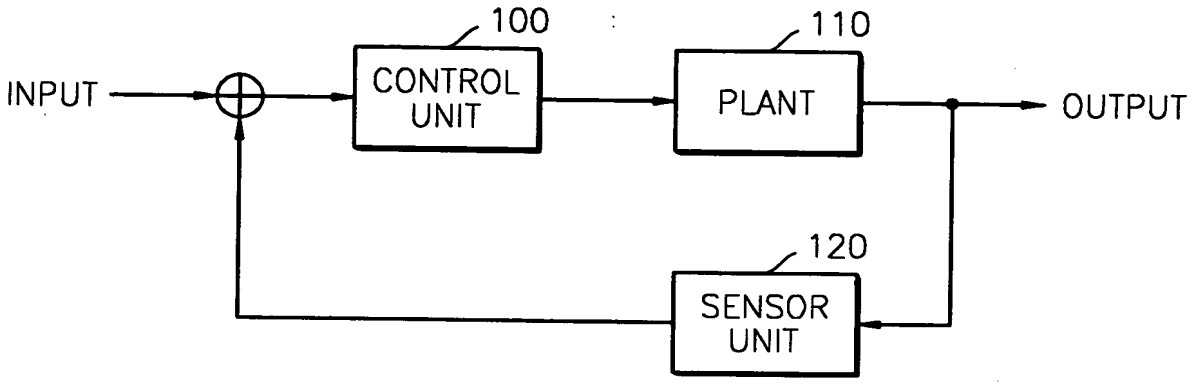


FIG. 2 (PRIOR ART)

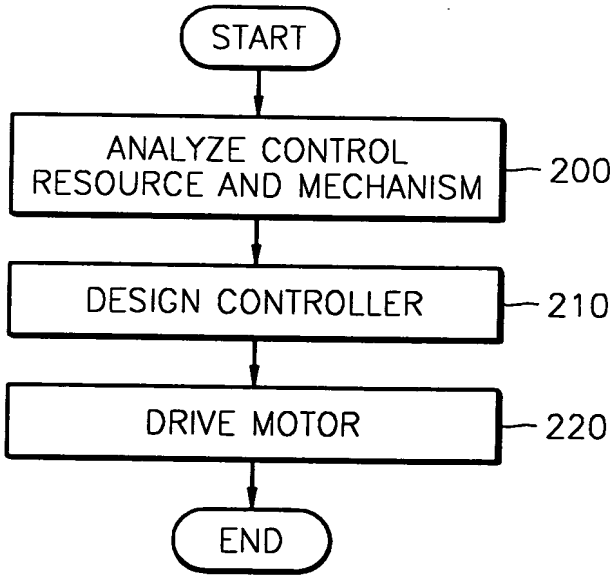


FIG. 3 (PRIOR ART)

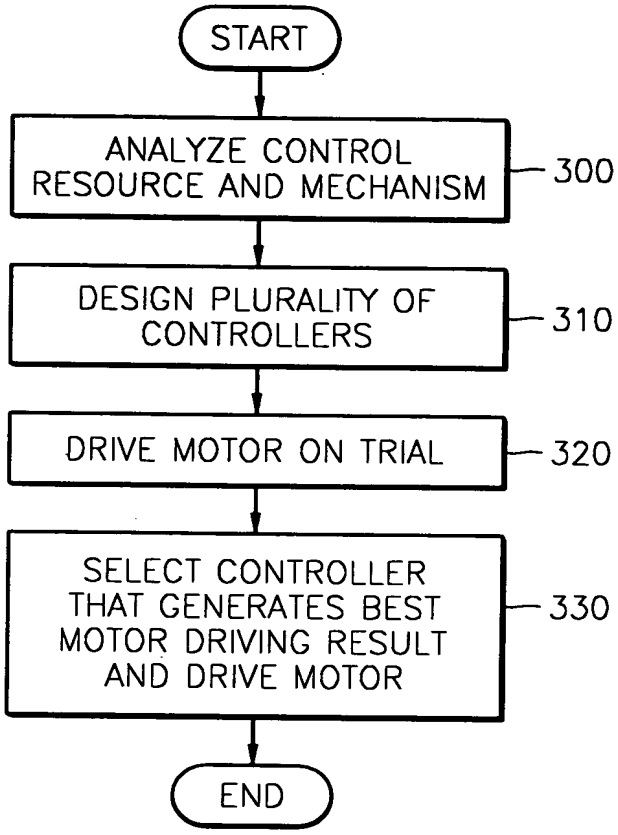


FIG. 4

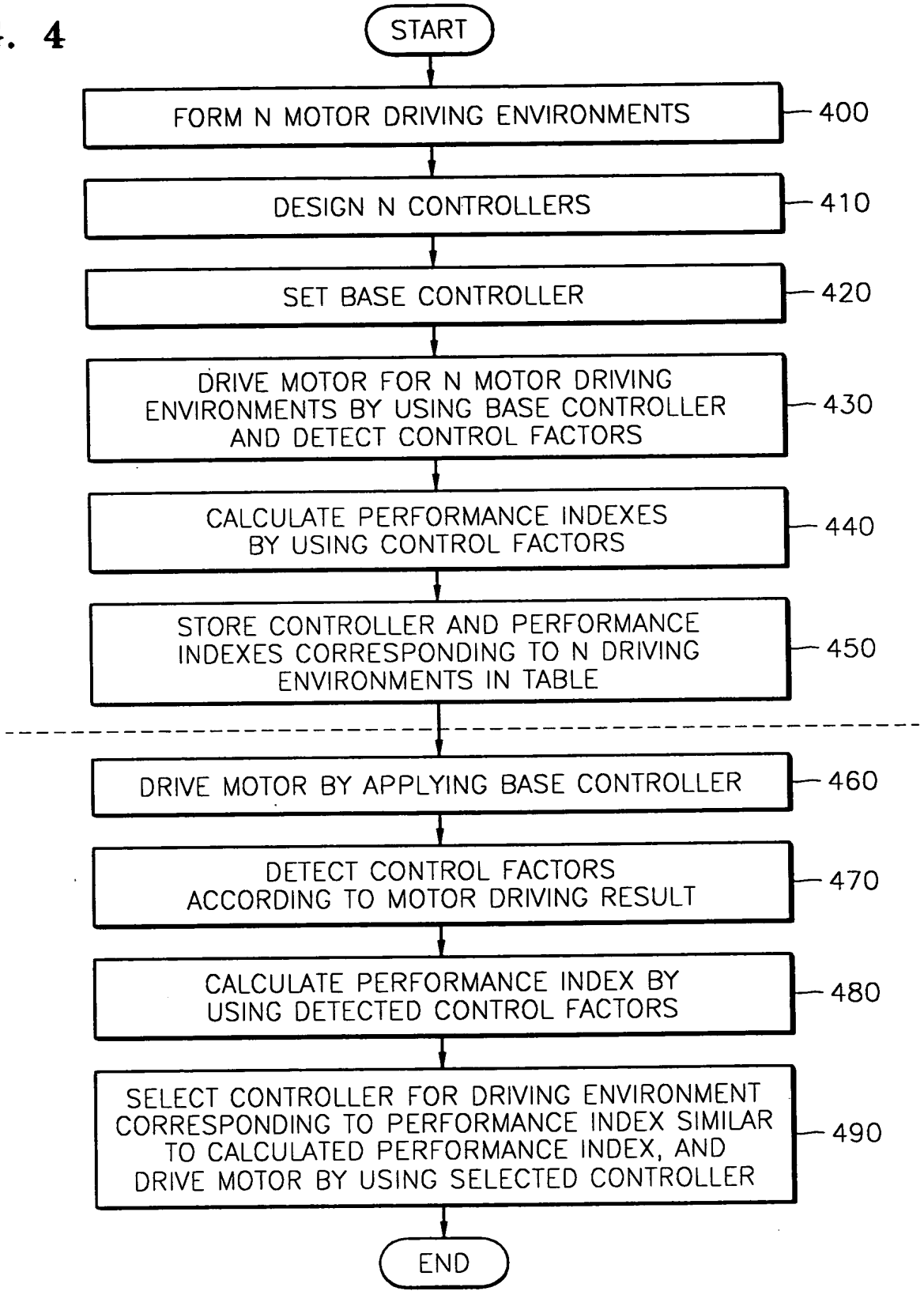

START
FORM N MOTOR DRIVING ENVIRONMENTS
400
DESIGN N CONTROLLERS
410
SET BASE CONTROLLER
420
DRIVE MOTOR FOR N MOTOR DRIVING ENVIRONMENTS BY USING BASE CONTROLLER AND DETECT CONTROL FACTORS
430
CALCULATE PERFORMANCE INDEXES BY USING CONTROL FACTORS
440
STORE CONTROLLER AND PERFORMANCE INDEXES CORRESPONDING TO N DRIVING ENVIRONMENTS IN TABLE
450
DRIVE MOTOR BY APPLYING BASE CONTROLLER
460
DETECT CONTROL FACTORS ACCORDING TO MOTOR DRIVING RESULT
470
CALCULATE PERFORMANCE INDEX BY USING DETECTED CONTROL FACTORS
480
SELECT CONTROLLER FOR DRIVING ENVIRONMENT CORRESPONDING TO PERFORMANCE INDEX SIMILAR TO CALCULATED PERFORMANCE INDEX, AND DRIVE MOTOR BY USING SELECTED CONTROLLER
490
END

FIG. 5

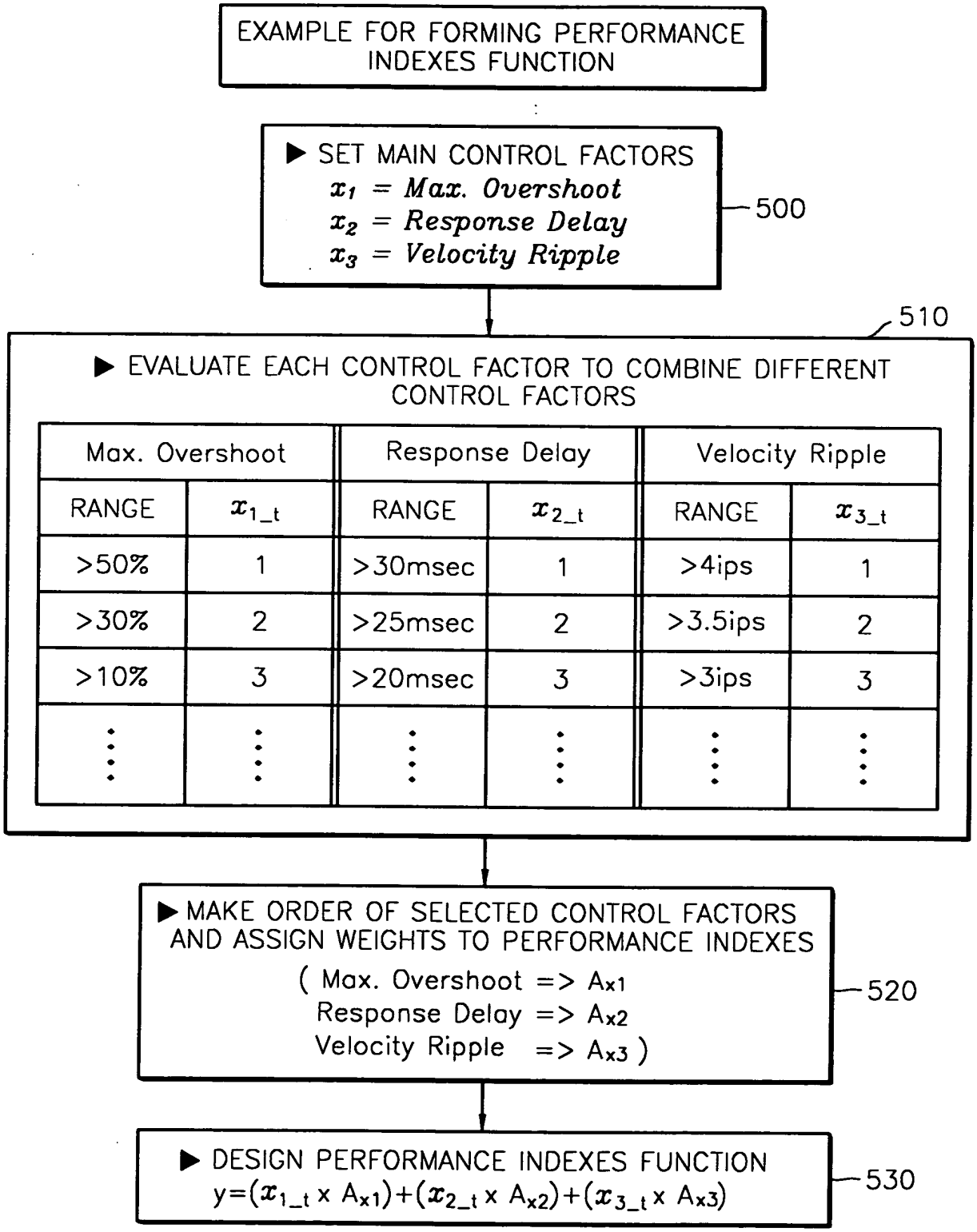
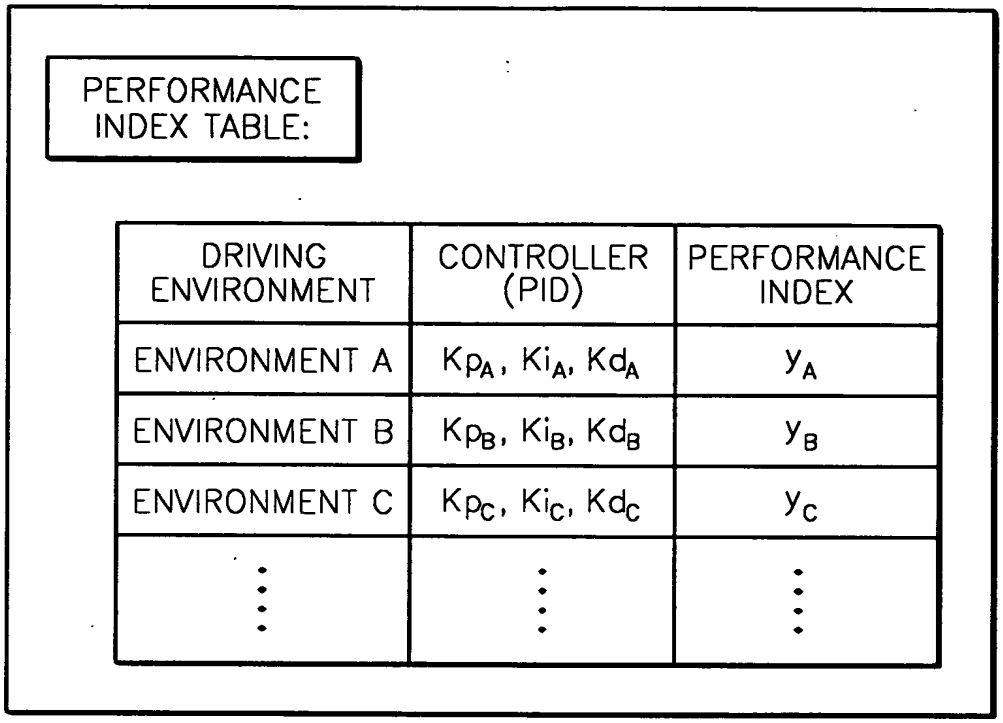

EXAMPLE FOR FORMING PERFORMANCE INDEXES FUNCTION
▶ SET MAIN CONTROL FACTORS
x_1 = Max. Overshoot
x_2 = Response Delay
x_3 = Velocity Ripple
500
510
▶ EVALUATE EACH CONTROL FACTOR TO COMBINE DIFFERENT CONTROL FACTORS
Max. Overshoot
Response Delay
Velocity Ripple
RANGE
x_{1_t}
RANGE
x_{2_t}
RANGE
x_{3_t}
>50% 1 >30msec 1 >4ips 1
>30% 2 >25msec 2 >3.5ips 2
>10% 3 >20msec 3 >3ips 3
▶ MAKE ORDER OF SELECTED CONTROL FACTORS AND ASSIGN WEIGHTS TO PERFORMANCE INDEXES
(Max. Overshoot => A_{x1}
Response Delay => A_{x2}
Velocity Ripple => A_{x3})
520
▶ DESIGN PERFORMANCE INDEXES FUNCTION
$y=(x_{1\_t} \times A_{x1})+(x_{2\_t} \times A_{x2})+(x_{3\_t} \times A_{x3})$
530

FIG. 6


PERFORMANCE INDEX TABLE:
DRIVING ENVIRONMENT
CONTROLLER (PID)
PERFORMANCE INDEX
ENVIRONMENT A
Kp_A, Ki_A, Kd_A
y_A
ENVIRONMENT B
Kp_B, Ki_B, Kd_B
y_B
ENVIRONMENT C
Kp_C, Ki_C, Kd_C
y_C